



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/909,532      | 07/20/2001  | Kie Y. Ahn           | 303.377US3          | 1731             |

21186 7590 06/05/2002

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. BOX 2938  
MINNEAPOLIS, MN 55402

[REDACTED] EXAMINER

GUERRERO, MARIA F

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

2822

DATE MAILED: 06/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |              |
|------------------------------|-----------------|--------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |
|                              | 09/909,532      | AHN ET AL.   |
|                              | Examiner        | Art Unit     |
|                              | Maria Guerrero  | 2822         |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 March 2002.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 49-80 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 49-80 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,4.

4) Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.

5) Notice of Informal Patent Application (PTO-152)

6) Other:

## DETAILED ACTION

1. This Office Action is in response to the Preliminary Amendment filed July 20, 2001.

Claims 1-48 are canceled.

Claims 49-80 are pending.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 49-80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 of U.S. Patent No. 6,350,704. Although the conflicting claims are not identical, they are not patentably distinct from each other because Ahn et al. (U.S. 6,350,704) teaches coating at least a portion of a surface of the substrate and at least one of the plurality of circuit elements with a mixture of oxide and carbon sources and transforming the mixture into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter

between 20 angstroms and 300 angstroms and which has a dielectric constant less than approximately 2.0.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 54, 57, 59-76, 78-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sigh et al. in view of Gnade et al. (U.S. 5,470,802).

Sigh et al. discloses coating at least a portion of a surface of a substrate with a mixture of oxide and carbon sources and transforming the mixture into a porous oxide insulator on the integrated circuit. Sigh et al. also teaches silicon oxycarbides having an average pore size of ~ 30 angstroms, the silicon oxycarbides display a greater thermal stability of surface area than pure silica (page 2696-2704).

Sigh et al. teaches using methyltrimethoxysilane (MDMS), tetraethoxysilane (TEOS), and silicon alkoxides (page 2696). The step of transforming includes heating between 450° and 1200° C at 0.5 hours to 24 hours, drying and pyrolyzing in argon atmosphere, respectively is disclosed, for example, on page 2698, column 1, first paragraph.

Sigh et al. fails to show providing a plurality of circuit elements on a substrate, forming vias in the porous oxycarbide dielectric layer, forming metal layers in the vias, using a CMP process to obtain a desired thickness of the silicon oxycarbide layer. However, Gnade et al. teaches providing a plurality of circuit elements on a substrate, forming vias in the porous dielectric layer, forming metal layers in the vias, using a CMP process to obtain a desired thickness of the porous dielectric. (Figs. 1-8D, col. 2, lines 30-40, col. 4, lines 15-67, col. 6, lines 35-67, cols. 7-8, col. 9, lines 15-65).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify Sigh et al.'s process by including the conventional process of etching and polishing taught by Gnade et al. The modification would complete a process of making a porous oxycarbide porous layer that would be more thermal stable than a conventional porous silica layer. (Singh et al., page 2704).

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is (703) 305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, can be reached on (703) 308-4940. The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

MG

May 30, 2002

*Carl Whitehead*  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800